

Logarithms Q1 (24/6/23)

Show that $\ln(x - \sqrt{x^2 - 1}) = -\ln(x + \sqrt{x^2 - 1})$

Solution

$$-\ln(x + \sqrt{x^2 - 1}) = \ln\left(\frac{1}{x + \sqrt{x^2 - 1}}\right)$$

$$= \ln\left(\frac{1}{x + \sqrt{x^2 - 1}} \cdot \frac{x - \sqrt{x^2 - 1}}{x - \sqrt{x^2 - 1}}\right)$$

$$= \ln\left(\frac{x - \sqrt{x^2 - 1}}{1}\right)$$